

Therefore, a user of the foldable display apparatus may watch a flat panel image displayed on the flexible display panel 100 that is spread flat.

**[0037]** In addition, when storing or carrying the foldable display apparatus, the case 300 is folded as shown in FIG. 4. Here, the first and second rotary supports 212 and 222 of the first and second support plates 210 and 220 are rotated, such that the first and second stoppers 312 and 322 support a folding portion 100a of the flexible display panel 100. As such, the folding portion 100a may be gently curved along with the curved recess 331a. Therefore, the folding portion 100a of the flexible display panel 100 is not sharply bent (creased) when folding the display apparatus. The first and second stoppers 312 and 322 may have angled ends that are configured to contact the first and second rotary supports 212 and 222. The angle of the ends may be configured to correspond to a folding angle of the first and second rotary supports 212 and 222. Accordingly, the flexible display panel 100 may not be damaged by the folding operation.

**[0038]** The folding and unfolding the folding portion 100a of the flexible display panel 100 is described in more detail with reference to FIGS. 5A through 5D. That is, in an unfolded state, the first and second rotary supports 212 and 222 of the first and second support plates 210 and 220 are supported by the semi-circular rib 331b of the curved case 331, so that the first and second rotary supports 212 and 222 may be parallel with (in the same plan as) the first and second fixed supports 211 and 221, as shown in FIG. 5A. Accordingly, the flexible display panel 100 may be supported by the first and second support plates 210 and 220 to be totally flat.

**[0039]** When a folding operation starts in the above state, the first and second rotary supports 212 and 222 are pushed by the folding portion 100a and rotate as shown in FIG. 5B. Here, the first and second rotary supports 212 and 222 are moved away from the semi-circular rib 331b, according to the folding operation, as the first and second rotary supports 212 and 222 rotate.

**[0040]** As shown in FIG. 5C, the first and second stoppers 312 and 322 contact the first and second rotary supports 212 and 222 to facilitate the bending of the bending portion 100a. If the folding operation is further performed in this state, the first and second cases 310 and 320 completely overlap with each other in a folded state, as shown in FIG. 5D. In the folded state, the folding portion 100a of the flexible display panel 100 forms a gentle curve along the curved recess 331a, rather than a sharp crease. Thus, the flexible display panel 100 may not be damaged by the folding operation, as described above.

**[0041]** On the other hand, when unfolding the foldable display apparatus in the folded state as above, the processes of the folding operation are performed in an opposite manner, and when the unfolding operation is finished, the flexible display panel 100 is entirely supported by the first and second support plates 210 and 220 and is in flat state. Therefore, the flat state of the flexible display panel 100 may be firmly maintained. Thus, the images may be stably displayed on the flat panel screen.

**[0042]** Therefore, according to various embodiments, the folding portion of the flexible display panel may be supported to have a gentle radius of curvature when folding the foldable display apparatus. Accordingly, the flexible display panel may not be damaged. Also, when unfolding the display apparatus, the entire surface of the flexible display panel may be supported firmly in a flat state. Thus, the images may be stably displayed on the flat screen of the flexible display panel.

**[0043]** It will be apparent to those skilled in the art that various modifications and variation can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

What is claimed is:

1. A foldable display apparatus comprising:

a flexible display panel;

a case comprising a first case body, a second case body, and a hinge coupling the first and second case bodies;

a first support plate coupled to the first case body to support a first side of the flexible display panel; and

a second support plate coupled to the second case body to support a second side of the flexible display panel.

2. The foldable display apparatus of claim 1, wherein:

the first support plate comprises a first fixed support fixed disposed on the first case, and a first rotary support flexibly coupled to the first fixed support; and

the second support plate comprises a second fixed support fixed on the second case, and a second rotary support flexibly coupled to the second fixed support.

3. The foldable display apparatus of claim 2, wherein:

the first rotary support and the second rotary support are disposed adjacent to the hinge; and

the first fixed portion and the second fixed portion are disposed on opposing sides of hinge.

4. The foldable display apparatus of claim 3, wherein the flexible display panel is fixed to the first fixed support and the second fixed support and moveable with respect to the first rotary support and the second rotary support.

5. The foldable display apparatus of claim 4, wherein the first rotary support and the second rotary supports support a folding portion of the flexible display panel and are rotated when the case is folded.

6. The foldable display apparatus of claim 2, wherein the hinge comprises a curved case comprising a curved recess configured to accommodate the folding portion of the flexible display panel when the case is folded.

7. The foldable display apparatus of claim 6, wherein the hinge further comprises a hinge pin and a hinge cap coupling the curved case to the first case body and the second case body.

8. The foldable display apparatus of claim 6, wherein edges of the curved case are configured to support the first rotary support and the second rotary support when the case is unfolded, such that the first and second rotary supports, are in the same plane as the first and second fixed supports.

9. The foldable display apparatus of claim 8, wherein the curved case is semicircular in cross-section.

10. The foldable display apparatus of claim 2, wherein the first case body and the second case body comprise stoppers configured to contact the first and second rotary supports when the case is in a folded position, and configured to be spaced apart from the first and second rotary supports when the case is in an unfolded position.

11. The foldable display apparatus of claim 10, wherein the ends of the stoppers are configured to contact the first and second rotary supports, and are angled to correspond to a folding angle of the first and second rotary supports when the case is in a folded position.